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Searching for Gravitational Waves from Magnetar Remnants of Gamma-Ray Bursts using CoCoA ERIC SOWELL, ALESSANDRA CORSI, Texas Tech University, ROBERT COYNE, University of Rhode Island — On August 17th of 2017 the detection of gravitational waves (GWs) and light from GW170817, a Binary Neutron Star (BNS) merger located at a distance of 40 Mpc, offered us the very first opportunity to investigate directly the nature of the post-merger remnant of BNS mergers. While the nature of the GW170817 remnant is still highly debated, it has been suggested that a NS may have formed in this merger. The idea that long-lived magnetized NS (magnetars) may form in BNS mergers was also previously proposed to explain the 'plateau' feature found in the X-ray afterglow of some short GRBs. The detection of GWs from a leftover magnetar would provide direct proof of the nature of the merger remnant and insights into the equation of state of nuclear matter. Here we present a new data analysis technique based on the Cross Correlation Algorithm (CoCoA) via which the current reach of GW searches for post-merger remnants could be significantly increased, and discuss its implications for current and future observing runs of the LIGO detectors.

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